

**IN THE UNITED STATES DISTRICT COURT
FOR THE EASTERN DISTRICT OF TEXAS
SHERMAN DIVISION**

IMPERIUM IP HOLDINGS
(CAYMAN), LTD.,

Plaintiff,

V.

SAMSUNG ELECTRONICS CO.,
LTD., et al.,

Defendants.

Case No. 4:14-cv-00371-ALM

**IMPERIUM'S RENEWED MOTION FOR JUDGMENT AS A MATTER OF LAW
ON THE VALIDITY OF U.S. PATENT NO. 6,836,290**

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PRELIMINARY STATEMENT

The Supreme Court established in its landmark 2007 *KSR* decision that a patent is not obvious simply because each of its elements appeared in the prior art; rather, obviousness requires evidence of a reason to combine the prior art.¹ In *Broadcom v. Emulex*, the Federal Circuit further explained that “a finding of obviousness at the time of invention requires a plausible rational[e] as to why the prior art references would have worked together.”² Samsung failed to meet that requirement at trial. Instead, Samsung selectively combined references to reconstruct the elements of claim 10, without adducing any reasons for these combinations other than those “gleaned from [the ’290 patent] itself.”³ Both the Federal Circuit and this Court have repeatedly held that this constitutes the impermissible use of hindsight.⁴ For instance, in *Nichia v. Everlight Electronics*, Judge Gilstrap explained again that:

[I]t is impermissible to use the patented invention as a blueprint or template to perform a hindsight reconstruction of the invention from prior art elements. Using the invention as a roadmap to re-create the invention from the prior art would improperly discount the value of combining various existing features or principles in new ways to achieve a new result, which is often the very essence or definition of invention [T]he motivation to combine references cannot come from the invention itself.⁵

¹ *KSR Intern. Co. v. Teleflex Inc.*, 550 U.S. 398, 418, 421 (2007).

² *Broadcom Corp. v. Emulex Corp.*, 732 F.3d 1325, 1335 (Fed. Cir. 2013) (citing *Power-One, Inc. v. Artesyn Technologies, Inc.*, 599 F.3d 1343, 1351-52 (Fed. Cir. 2010)) (quotes omitted).

³ *Interconnect Planning Corp. v. Fell*, 774 F.2d 1132, 1143 (Fed. Cir. 1985).

⁴ *E.g., id.* (citing *ACS Hospital Sys., Inc. v. Montefiore Hospital*, 732 F.2d 1572, 1577 & n. 14 (Fed. Cir. 1984)); *ATD Corp. v. Lydall, Inc.*, 159 F.3d 534, 546 (Fed. Cir. 1998) (“Determination of obviousness cannot be based on the hindsight combination of components selectively culled from the prior art to fit the parameters of the patented invention”); *Nichia Corp. v. Everlight Electronics Co.*, 2016 WL 310142, at *62 (E.D. Tex. Jan. 25, 2016) (Gilstrap, J.) (citing *Iron Grip Barbell Co., Inc. v. USA Sports, Inc.*, 392 F.3d 1317, 1320 (Fed. Cir. 2004)) (same).

⁵ *Nichia*, 2016 WL 310142 at *62 (citations omitted); *see also Interconnect Planning*, 774 F.2d at 1143 (“When prior art references require selective combination by the court to render obvious a subsequent invention, there must be some reason for the combination other than the hindsight gleaned from the invention itself. There must be ‘something in the prior art as a whole to suggest the desirability, and thus the obviousness, of making the combination’ ”).

Indeed, the only record evidence that provides a reason to combine a dual single-ended and differential data interface circuit with a CMOS image sensor appears in the '290 patent-in-suit itself. Aside from suggesting that such evidence existed in the prior art, Samsung merely offered generalized “reasons” to solve the alleged issues of size, cost, performance, and versatility associated with interfaces and image sensors. These reasons would not have motivated a person of ordinary skill in the art to arrive at the invention claimed in the '290 patent. And Samsung offered no evidence to show that its proffered combinations would have solved the issues purportedly identified in the prior art as motivating factors behind those combinations. Accordingly, Samsung did not satisfy its burden of proving invalidity to the jury by clear and convincing evidence, and Imperium respectfully requests that the Court grant judgment as a matter of law that claim 10 of the '290 patent is not invalid.

FACTUAL BACKGROUND

Claim 10 of the '290 patent recites:

A CMOS imaging apparatus, comprising:

a CMOS image sensor, the sensor having a data interface circuit comprising:

a first single-ended interface connected to a first signal output line;

a second single-ended interface connected to a second signal output line; and

a differential interface having a normal signal output connected to the first output line and a complementary signal output connected to the second signal output line;

wherein an output of the data interface circuit is selectable between a single-ended interface output and a differential interface output; and

an image processor connected to the CMOS image sensor to receive the signals output by the data interface circuit.⁶

As such, the claimed invention has an image sensor with an interface that can provide a single-ended output and a differential output, and can select which of the two outputs to provide.⁷

⁶ '290 patent, D.I. 87-2, at col. 5, ln. 45 to col. 6, ln. 6.

⁷ See *id.* at col. 5, ll. 46-47; col. 6, ll. 1-3.

At trial, Samsung did not argue that claim 10 was anticipated by a single prior art reference, despite having alleged anticipation in its invalidity contentions. Instead, Samsung offered two purportedly invalidating combinations of prior art: (1) U.S. Patent Nos. 5,929,655 (“Roe”) and 6,452,632 (“Umeda”); and (2) Japanese Patent Publication No. 1997-6592 (“Toshiba”) and Umeda.⁸ Samsung offered just two reasons why a person of ordinary skill in the art would have been motivated to combine Roe or Toshiba with Umeda: (1) that these combinations would result in a size (pin count) reduction, and associated cost savings, for the interface and image sensor disclosed in Umeda,⁹ and (2) that these combinations would improve the performance and versatility of Umeda’s interface/image sensor, enabling compatibility with “well-known standards” like IEEE-1394 and PC card.¹⁰

After the close of evidence and before deliberations, Imperium moved for JMOL on Samsung’s anticipation and obviousness defenses under Federal Rule of Civil Procedure 50(a), arguing no reasonable jury would have a legally sufficient basis to find the patents-in-suit invalid based on the evidence presented.¹¹ Samsung made its own motion for JMOL that no reasonable jury could find the patents not invalid.¹² The Court denied both motions,¹³ and the jury ultimately found claim 10 of the ’290 patent—the sole asserted claim from that patent—invalid as obvious.¹⁴ Imperium now renews its motion for JMOL on the validity of that claim.

⁸ See D.I. 320, 2/4/2016 p.m. trial transcript at 4:19-37:1, 50:6-9.

⁹ See *id.* at 9:11-10:1, 11:20-25, 12:4-8, 33:5-7.

¹⁰ See *id.* at 11:20-12:8, 33:7-10.

¹¹ See D.I. 322, 2/5/2016 p.m. trial transcript at 206:2-8.

¹² See *id.* at 206:9-12.

¹³ See *id.* at 206:13.

¹⁴ See D.I. 253, jury verdict at p. 6.

ARGUMENT

I. LEGAL STANDARD

A. Judgment as a Matter of Law

Federal Rule of Civil Procedure 50(b) provides that “[i]f the court does not grant a motion for [JMOL] made under Rule 50(a), the court is considered to have submitted the action to the jury subject to the court’s later deciding the legal questions raised by the motion.”¹⁵ A party may renew its request for JMOL within 28 days after entry of judgment.¹⁶ The motion is reviewed under the law of the regional circuit.¹⁷ On a renewed motion for JMOL following a verdict, courts in the Fifth Circuit determine “whether the state of proof is such that reasonable and impartial minds could reach the conclusion the jury expressed in its verdict.”¹⁸ Applying that standard, the Federal Circuit and this Court have often confirmed the validity of a patent claim, whether on JMOL or summary judgment.¹⁹

¹⁵ Fed. R. Civ. P. 50(b).

¹⁶ *See id.*

¹⁷ *Summit Technology, Inc. v. Nidek Co., Ltd.*, 363 F.3d 1219, 1223 (Fed. Cir. 2004).

¹⁸ *Contentguard Holdings, Inc. v. Google, Inc.*, 2016 WL 3655603, at *1 (E.D. Tex. Jul. 8, 2016) (Gilstrap, J.) (citing *Am. Home Assur. Co. v. United Space Alliance*, 378 F.3d 482, 487 (5th Cir. 2004)) (internal quotations omitted); *accord Kinetic Concepts, Inc. v. Smith & Nephew, Inc.*, 688 F.3d 1342, 1356 (Fed. Cir. 2012) (“In the Fifth Circuit, JMOL may be granted by the trial court only if the facts and inferences point so strongly and overwhelmingly in favor of one party that the Court believes that reasonable men could not arrive at a contrary verdict”) (citing *Broussard v. State Farm Fire & Cas. Co.*, 523 F.3d 618, 624 (5th Cir. 2008)) (internal quotations omitted).

¹⁹ *E.g., SynQor, Inc. v. Artesyn Techs., Inc.*, 709 F.3d 1365, 1373-78 (Fed. Cir. 2013) (confirming validity on appeal); *Kinetic Concepts*, 688 F.3d at 1360-71 (same); *Hearing Components, Inc. v. Shure Inc.*, 600 F.3d 1357, 1372-75 (Fed. Cir. 2010), abrogated on other grounds by *Nautilus, Inc. v. Biosig Instruments, Inc.*, 134 S. Ct. 2120 (2014) (same); *Cardiac Pacemakers, Inc. v. St. Jude Medical, Inc.*, 381 F.3d 1371, 1375-78 (Fed. Cir. 2004) (same); *Oasis Research, LLC v. Carbonite, Inc.*, 2015 WL 123642, at *3-10 (E.D. Tex. Jan. 8, 2015) (Mazzant, J.) (granting plaintiff’s post-verdict motion for JMOL on validity); *Cassidian Communications, Inc. v. MicroDATA GIS, Inc.*, 2014 WL 3924255, at *5-11 (E.D. Tex. Aug. 8, 2014), vacated in part, 2015 WL 1848533 (E.D. Tex. Apr. 20, 2015) (Gilstrap, J.) (same); *Function Media, L.L.C. v. Google, Inc.*, 2011 WL 4017953, at *2-3 (E.D. Tex. Sep. 9, 2011) (Everingham, J.) (same).

B. Obviousness Under 35 U.S.C. § 103

The Supreme Court set forth in *KSR v. Teleflex* that “a patent composed of several elements is not proved obvious merely by demonstrating that each of its elements was, independently, known in the prior art.”²⁰ As such, controlling authority requires the existence of some reason to combine elements from various prior art references to arrive at the claimed invention.²¹ And because obviousness is analyzed from the perspective of one skilled in the art at the time of the invention,²² that reason, if any, must have existed at or before the time of the invention.²³ Reasons to combine the teachings of the prior art, like other aspects of the obviousness inquiry, must be supported by clear and convincing evidence,²⁴ and cannot be grounded on speculation or conjecture.²⁵ A combination based purely on speculation or

²⁰ *KSR*, 550 U.S. at 418.

²¹ See, e.g., *In re Urbanski*, 809 F.3d 1237, 1241 (Fed. Cir. 2016) (“Obviousness is a question of law based on underlying factual findings, including . . . the existence of a reason to combine references”) (citations omitted); *Innogenetics, N.V. v. Abbott Labs*, 512 F.3d 1363, 1374 (Fed. Cir. 2008) (“[S]ome kind of motivation must be shown from some source, so that the jury can understand why a person of ordinary skill in the art would have thought of either combining two or more references or modifying one to achieve the patented method”) (quotations omitted); *TQP Development, LLC v. 1-800-Flowers.com, Inc.*, 120 F.Supp.3d 600, 619 (E.D. Tex. 2015) (Gilstrap, J.) (“Generally, a party seeking to invalidate a patent as obvious must demonstrate . . . that a skilled artisan would have had reason to combine the teaching of the prior art references to achieve the claimed invention”) (citations, quotations omitted); see also, e.g., *Nike, Inc. v. Adidas AG*, 812 F.3d 1326, 1335 (Fed. Cir. 2016) (“A claimed invention may be obvious even when the prior art does not teach each claim limitation, so long as the record contains some reason why one of skill in the art would modify the prior art to obtain the claimed invention”); see also *Fresenius USA, Inc. v. Baxter Intern., Inc.*, 582 F.2d 1288, 1300-1301 (Fed. Cir. 2009) (“[I]t remains appropriate for a post-*KSR* court considering obviousness to determine whether there was an apparent reason to combine the known elements in the fashion claimed by the patent at issue.”).

²² E.g., *Unigene Laboratories, Inc. v. Apotex, Inc.*, 655 F.3d 1352, 1360 (Fed. Cir. 2011).

²³ See *KSR*, 550 U.S. at 420; *Rolls-Royce, PLC v. United Technologies Corp.*, 603 F.3d 1325, 1338 (Fed. Cir. 2010); *Rothman v. Target Corp.*, 556 F.3d 1310, 1319-20 (Fed. Cir. 2009).

²⁴ See *Kinetic Concepts, Inc. v. Smith & Nephew, Inc.*, 688 F.3d 1342, 1366-67 (Fed. Cir. 2012) (citing *Innogenetics*, 512 F.3d at 1374) (“Even if the references disclosed all of the limitations of the asserted claims, which they do not, S & N still needed to proffer evidence indicating why a person having ordinary skill in the art would combine the references to arrive at the claimed invention”); *TQP Development*, 120 F.Supp.3d at 619 (reason to combine must be demonstrated by clear and convincing evidence); *Rembrandt Wireless Technologies, LP v. Samsung Electronics Co., Ltd.*, 2016 WL 633909, at *2-6 (E.D. Tex. Feb. 17, 2016) (Gilstrap, J.) (same).

²⁵ E.g., *Alza Corp. v. Mylan Laboratories, Inc.*, 464 F.3d 1286, 1290 (Fed. Cir. 2006) (“At its core, our anti-hindsight jurisprudence is a test that rests on the unremarkable premise that legal determinations of

conjecture, without reason and the requisite evidentiary support, derives from improper hindsight,²⁶ and cannot be used to determine whether a claim would have been obvious to one of ordinary skill in the art.²⁷

II. ANALYSIS

Whether there was a reason to combine particular references is a question of fact.²⁸ In this case, the evidence presented at trial was insufficient to find a reason to combine the asserted prior art references. Indeed, the only evidence in the record that demonstrates an apparent reason to combine a dual single-ended and differential interface with an image sensor in the manner of the '290 patent, which Samsung argued was the product of its proffered combinations, came from the '290 patent itself. Thus, the “reasons” for Samsung’s combinations could not have originated from any source other than hindsight—i.e., the source which the Supreme Court, the Federal Circuit, and this Court have all long held insufficient as a matter of law to render a claim obvious. Consequently, the “state of proof” was not such that “reasonable and impartial minds” could have reached the conclusion of obviousness for this '290 claim. Judgment as a matter of law for that claim’s validity should be granted accordingly.

obviousness, as with such determinations generally, should be based on *evidence* rather than on mere speculation or conjecture”) (emphasis added).

²⁶ *See id.*

²⁷ *See KSR*, 550 U.S. at 421 (“A factfinder should be aware . . . of the distortion caused by hindsight bias and must be cautious of arguments reliant upon *ex post* reasoning”) (ital. original); *W.L. Gore & Assocs. v. Garlock, Inc.*, 721 F.2d 1540, 1553 (Fed. Cir. 1983) (“To imbue one of ordinary skill in the art with knowledge of the invention in suit, when no prior art reference or references of record convey or suggest that knowledge, is to fall victim to the insidious effect of a hindsight syndrome wherein that which only the inventor taught is used against its teacher”); *Abstrax v. Dell, Inc.*, 2009 WL 3255085, at *6 (E.D. Tex. Oct. 7, 2009) (Folsom, J.) (“It is improper to use the benefit of hindsight when considering the question of obviousness”).

²⁸ *Transocean Offshore Deepwater Drilling, Inc. v. Maersk Contractors USA, Inc.*, 617 F.3d 1296, 1303 (Fed. Cir. 2010) (citing *McGinley v. Franklin Sports, Inc.*, 262 F.3d 1339, 1352 (Fed. Cir. 2001); *Nike*, 812 F.3d at 1335 (citing *Pregis Corp. v. Kappos*, 700 F.3d 1348, 1353 (Fed. Cir. 2012)); *Winner Int’l Royalty Corp. v. Wang*, 202 F.3d 1340, 1348 (Fed. Cir. 2000)).

A. Samsung Offered No Evidence that Combining Roe or Toshiba with Umeda Would Have Reduced Pin Count or Cost

As noted earlier, Samsung's first reason to combine Roe or Toshiba with Umeda was that the combination would reduce the number of pins used by—and the cost associated with—the interface of the Umeda image sensor,²⁹ two characteristics purportedly identified as desirable by Umeda.³⁰ The only evidence Samsung presented in support of this argument was the testimony of its expert Dr. Baker. Samsung offered no evidence to explain why or how using the interface of Roe or Toshiba would have resulted in a pin count or cost reduction of Umeda's interface. Indeed, Dr. Baker never provided such an explanation. He merely testified in conclusory fashion that using Roe or Toshiba would achieve a size and cost reduction.³¹ Thus, no record evidence showed that the proffered combinations would have yielded any of these purported size and cost benefits—which, critically, Samsung claimed would have served as the impetus for a person of ordinary skill in the art to make those combinations.

Dr. Baker did testify that the number of pins on an interface can be reduced by sharing them,³² presumably between portions of the interface that would otherwise have their own dedicated sets of pins. He further testified that Roe and Toshiba reduced the number of pins in their respective systems by having single-ended interfaces share pins with a differential interface.³³ But the evidence did not show that using Roe or Toshiba with Umeda would have reduced the number of pins in Umeda's system. Further, the evidence did not show that using Roe or Toshiba with Umeda would have reduced the cost of Umeda's system.

As Dr. Baker's own testimony demonstrates, sharing pins between a single-ended interface and a differential interface reduces the aggregate number of pins only when viewed in

²⁹ *Id.* at, e.g., 9:11-10:1; 11:20-12:3; 33:3-7, 18-22.

³⁰ *Id.* at, e.g., 11:22-25.

³¹ *Id.* at 34:3-6.

³² *Id.* at 34:8-9.

³³ *Id.* at 16:17-17:21, 25:14-26:6; 28:1-30:17.

comparison to a circuit containing two interfaces—a single-ended interface and a differential interface—that do not share pins with each other.³⁴ This precise relationship between aggregate pin counts for a system with interfaces that share pins and another with interfaces that do not is recognized in the '290 patent³⁵ and Roe.³⁶ However, in comparison to a circuit containing a purely single-ended interface or a purely differential interface (but not both), a combined single-ended and differential interface would not necessarily result in a smaller pin count, even when sharing pins. Indeed, it would more likely result in a *greater* pin count, given that a combined interface that can transmit both single-ended and differential signals has additional functionality—and thus requires additional pins—over and above a purely single-ended or purely differential interface. Samsung offered no evidence to suggest that swapping out a purely single-ended or purely differential interface for the interface of Roe or Toshiba would have reduced pin count. And, as explained below, the record shows that Roe or Toshiba would have reduced the pin count of Umeda's interface only if one first assumes that Umeda's interface employed two interfaces at the same time, without any pin sharing between them. Such an assumption, as the record further shows, was factually unsupported.

Notably, Roe and Toshiba each disclose a system containing an interface with two “pads,” or pins.³⁷ This system is called a “dual purpose I/O circuit” in Roe and a “semiconductor integrated circuit” in Toshiba. Unlike the interfaces in Roe or Toshiba, however, a purely single-

³⁴ See *id.*

³⁵ See '290 patent, D.I. 87-2, at, *e.g.*, col. 2, ll. 42-49 (“It is possible to place both [single-ended and differential] interfaces on the imager in order to support both types of companion chips, but this would add pins and cost. [¶] The best solution would be to implement an interface that could be selected to either support a single-ended interface or a differential interface using the same number of pins (i.e. without requiring twice the number of pins for the differential interface)”).

³⁶ See Ex. 1, Roe, U.S. Patent No. 5,929,655 at col. 1, ll. 20-30; col. 5, ll. 47-60.

³⁷ See Ex. 1, Roe, U.S. Patent No. 5,929,655 at, *e.g.*, col. 3, ln. 50 to col. 4, ln. 29; figure 2c (disclosing dual-purpose I/O circuit with two “conducting pads,” or pins); see also D.I. 320, 2/4/2016 p.m. trial transcript at 25:23-26:6 (referring to “pads” in Roe as “pins”). See Ex. 2, Toshiba, JP Patent Pub. No. 1997-6592, at, *e.g.*, p. 31, ¶0032; p. 34, ¶0038; figure 2 (disclosing semiconductor integrated circuit with two “signal output pads,” labeled 55a and 55b); see also D.I. 320, 2/4/2016 p.m. trial transcript at 16:17-17:5 (describing signal output pads 55a and 55b of Toshiba as “pins”).

ended interface uses only one pin.³⁸ For instance, each of the individual single-ended I/O cells in Roe, which Dr. Baker testified is a single-ended interface,³⁹ transmits signals over a single line and is connected to just one pin, called a “conducting pad.”⁴⁰ Likewise, each of the individual buffer circuits that Dr. Baker identified as single-ended interfaces in Toshiba⁴¹ uses a single transmission path⁴² connected to just one pin, called a “signal output pad.”⁴³ Thus, the interfaces of Roe and Toshiba each use more pins (two) than a single-ended interface (one). As a result, moving from a single-ended interface to Roe or Toshiba increases the pin count.

A differential interface, unlike a single-ended interface, uses two pins.⁴⁴ For instance, the differential I/O cell in Roe, which Dr. Baker testified is a differential interface,⁴⁵ uses two lines to transmit signals and is connected to two pins, or “conducting pads.”⁴⁶ Likewise, the differential buffer circuit that Dr. Baker identified as a differential interface in Toshiba uses two lines to transmit signals⁴⁷ and is connected to two pins, or “signal output pads.”⁴⁸ Thus, the interfaces of Roe and Toshiba each use the same number of pins (two) as a differential interface (two). Moving from a differential interface to Roe or Toshiba thus maintains the pin count.

³⁸ See, e.g., ’290 patent, D.I. 87-2, at col. 1, ll. 29-34; fig. 1; Ex. 1, Roe, U.S. Patent No. 5,929,655, at col. 2, ln. 64 to col. 3, ln. 3 (noting that single-ended I/O cell has one “associated conducting pad”).

³⁹ See D.I. 320, 2/4/2016 p.m. trial transcript at, e.g., 24:12-25:3, 28:1-12.

⁴⁰ See Ex. 1, Roe, U.S. Patent No. 5,929,655, at col. 6, ll. 55-58, 63-67; col. 12, ll. 20-23; figure 2c.

⁴¹ See D.I. 320, 2/4/2016 p.m. trial transcript at, e.g., 18:12-18.

⁴² See Ex. 2, Toshiba, at, e.g., p. 13, ll. 5-7.

⁴³ See *id.* at, e.g., p. 31, ll. 9-15; figure 2.

⁴⁴ See, e.g., ’290 patent, D.I. 87-2, at col. 2, ln. 62 to col. 3, ln. 15 (noting that to use a differential interface in place of a single-ended interface would “usually result in twice the number of pins, because two pins are used for each bit transfer”); see also *id.* at figure 3.

⁴⁵ See D.I. 320, 2/4/2016 p.m. trial transcript at, e.g., 24:12-25:3, 28:5-12.

⁴⁶ See Ex. 1, Roe, U.S. Patent No. 5,929,655, at col. 3, ll. 64-66; col. 7, ll. 5-8; col. 12, ll. 24-26; fig. 2c.

⁴⁷ See D.I. 320, 2/4/2016 p.m. trial transcript at 18:19-19:7.

⁴⁸ See Ex. 2, Toshiba, at, e.g., figure 2 (showing low-voltage differential signaling output buffer, LVDSO, connected to signal output pads 55a and 55b).

As such, replacing a single-ended interface or differential interface with the interface of Roe or Toshiba would not reduce the number of pins. Rather, the number of pins would either remain the same or even increase. Given this, the only way Roe or Toshiba could reduce the number of pins in Umeda's interface would be for Umeda to disclose an interface containing both a single-ended interface *and* a differential interface, without pin sharing. Such an interface, under the above paradigm, would contain a total of at least three pins: one pin for the single-ended interface portion, two pins for the differential interface portion. Samsung offered no evidence to show Umeda discloses such an interface. Dr. Baker pointed to Figure 14 of Umeda,⁴⁹ which describes appropriate interface(s) to be used with Umeda's image sensor as "PC Card, IEEE-1394, OR THE LIKE":⁵⁰

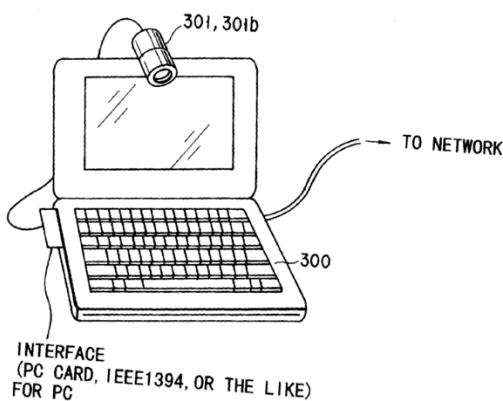


FIG. 14

But each of these exemplary interfaces in Umeda uses only a purely single-ended interface or a purely differential interface; neither uses a single-ended interface and a differential interface at the same time. As Dr. Baker testified, PC Card uses "a single-ended *or* differential interface,"⁵¹ and IEEE-1394 (or Firewire) uses a differential interface.⁵² Dr. Baker did not identify any other interfaces in Umeda.

⁴⁹ See D.I. 320, 2/4/2016 p.m. trial transcript at 6:11-23, 11:4-19.

⁵⁰ See Ex. 3, Umeda, U.S. Patent No. 6,452,632, figure 14.

⁵¹ See D.I. 320, 2/4/2016 p.m. trial transcript at 11:14-15 (emphasis added).

⁵² See *id.* at 11:16-19.

As a result, swapping out the interface in Umeda for the interface in Roe or Toshiba would *not* reduce the pin count, contrary to Samsung's arguments. If Umeda begins with a one-pin, single-ended interface such as single-ended PC Card, for instance, replacing that interface with the two-pin interface of Roe or Toshiba results in a pin count increase (from one pin to two pins). If Umeda begins with a two-pin, differential interface such as IEEE-1394 or differential PC Card, replacing that interface with the two-pin interface of Roe or Toshiba results in no change at all (i.e., pin count parity). The record contains no evidence that Umeda disclosed (or even contemplated) an interface with both a single-ended portion and a differential portion containing at least three pins in total, as would be necessary to substantiate Samsung's alleged "pin count reduction" reason to combine Roe or Toshiba with Umeda. For this same reason, Samsung's alleged "cost reduction" reason to combine is similarly unsupported, given that both Umeda and Dr. Baker tied the cost of an interface directly to the number of pins required.⁵³ In other words, the record itself contradicted Samsung's purported reasons to combine the prior art. Accordingly, a person of ordinary skill in the art would not have seen fit to combine Roe or Toshiba with Umeda, for either of these reasons.

1. Samsung's Alternative Arguments That a Person Skilled in the Art Would Have Been Motivated to Combine References for the '290 Patent Also Lack Any Evidentiary Support

To the extent Samsung contends a reason to combine nonetheless existed because the evidence shows that a person of ordinary skill in the art would have wanted both single-ended and differential interfaces available in a CMOS image sensor, that argument likewise fails. Aside from the disclosures of the '290 patent itself,⁵⁴ no record evidence showed that one of ordinary skill in the art would have desired a CMOS image sensor having a single-ended interface and a differential interface simultaneously. Relatedly, Samsung offered no evidence to show that

⁵³ See *id.* at, e.g., 9:11-24, 11:21-25, 33:5-7.

⁵⁴ See '290 patent, D.I. 87-2, at, e.g., col. 2, ll. 45-52.

incorporating a single-ended interface and a differential interface in a CMOS image sensor would have benefited a person of ordinary skill in the art, or that one of ordinary skill in the art would have found this desirable in some way. Samsung's reasons to combine are thus unsupported by the evidence. In light of this, as the Supreme Court and the Federal Circuit have reasoned, the only way in which Samsung could conceivably have arrived at its proffered combinations was through impermissible hindsight.⁵⁵

That Samsung relied solely on hindsight to formulate its obviousness theory is further underscored by the testimony of Dr. Baker, who repeatedly stated that one of ordinary skill "could" have used Roe or Toshiba with Umeda.⁵⁶ Dr. Baker's opinions about what could have been done present a classic example of hindsight.⁵⁷ The test for obviousness does not inquire whether one of ordinary skill "could" have reached the claimed invention, as Dr. Baker testified.⁵⁸ Rather, the proper test is whether one of ordinary skill in the art had some reason,

⁵⁵ See *KSR*, 550 U.S. at 421; *Alza*, 464 F.3d at 1290; *ATD*, 159 F.3d at 546; *Interconnect*, 774 F.2d at 1143; *W.L. Gore*, 721 F.2d at 1553; *Nichia*, 2016 WL 310142 at *62; *Abstrax*, 2009 WL 3255085 at *6.

⁵⁶ See D.I. 320, 2/4/2016 p.m. trial transcript at, e.g., 15:11-18 (stating that Toshiba's interface "could be used in a broad range of applications"; "Q. Now, Dr. Baker, do you have an opinion as to whether Umeda's video system that we talked about earlier could fall into Toshiba's broad range of applications? [¶] A. Yes, I do. [¶] Q. And what's that opinion? [¶] A. It absolutely could"); 23:2-9 ("Q. Dr. Baker, you've taken Toshiba Figure 2 and plugged it into interface 108 [of Umeda], is that correct? [¶] A. Yes. [¶] Q. Could you plug in a different interface into interface section 108? [¶] A. Yes. [¶] Q. Can you give us another example? [¶] A. The other example I brought today was Roe"); 32:1-3 ("Q. Dr. Baker, could a skilled designer use the interface of Roe that we just discussed as interface 108 in Umeda? [¶] A. Yes").

⁵⁷ See *InTouch Technologies, Inc. v. VGo Communications, Inc.*, 751 F.3d 1327, 1352 (Fed. Cir. 2014) ("VGo's expert [] succumbed to hindsight bias in her obviousness analysis. Dr. Yanco's testimony primarily consisted of conclusory references to her belief that one of ordinary skill in the art could combine these references, not that they would have been motivated to do so").

⁵⁸ Dr. Baker also suggested it would have been obvious to try to combine Toshiba with Umeda. See D.I. 320, 2/4/2016 p.m. trial transcript at 22:19-23:1. Whether something is "obvious to try" is not relevant to an obviousness analysis unless there is a design need or market pressure that would have led one of ordinary skill in the art to try to make the combination. See *Rolls-Royce*, 603 F.3d at 1339 ("A particular course or selection is not obvious to try unless some design need or market pressure or other motivation would suggest to one of ordinary skill to pursue the claimed course or selection") (citing *KSR*, 550 U.S. at 421); *KSR*, 550 U.S. at 421 ("[T]he court erred in concluding that a patent claim cannot be proved obvious merely by showing that the combination of elements was obvious to try. When there is a design need or market pressure to solve a problem and there are a finite number of identified, predictable solutions, a person of ordinary skill in the art has good reason to pursue the known options within his or her technical grasp"). Samsung offered no evidence of a design need or market pressure here.

supported by clear and convincing evidence, to combine the asserted prior art references to render the claimed invention obvious.⁵⁹ Samsung's alleged reasons for combining Roe or Toshiba with Umeda failed to meet this standard.

B. Samsung Offered No Evidence that Combining Roe or Toshiba with Umeda Would Increase Performance or Versatility

Samsung's second alleged reason for why a person skilled in the art would combine Roe or Toshiba with Umeda was that doing so would increase the performance and versatility of Umeda's image sensor.⁶⁰ Yet Samsung did not adduce evidence showing how, or why, the interface of Roe or Toshiba would have increased the performance or versatility of Umeda's image sensor. The only evidence in the record is Dr. Baker's conclusory testimony on the matter,⁶¹ which is insufficient.⁶² For this reason, Samsung's performance and versatility theories did not constitute a sufficient reason to combine.

Moreover, Samsung provided no evidence to establish that one of ordinary skill in the art would have been concerned about the performance or versatility of the Umeda interface or image sensor, or in CMOS image sensors generally. Notably, Samsung identified no evidence to show there was a problem with the performance or versatility of CMOS image sensors that was known in the prior art and needed to be solved. Indeed, the only document in the record that recognizes and solves performance- and versatility-related limitations associated with the need, and

⁵⁹ See *KSR*, 550 U.S. at 421 (obviousness requires "determin[ing] whether there was an apparent reason to combine the known elements in the fashion claimed by the patent at issue"); *Plantronics, Inc. v. Alph, Inc.*, 724 F.3d 1343, 1353 (Fed. Cir. 2013) (clear and convincing evidence required to prove obviousness).

⁶⁰ See D.I. 320, 2/4/2016 p.m. trial transcript at, e.g., 11:23-12:3.

⁶¹ See *id.* at, e.g., 10:2-17; 12:1; 33:7-8, 23-35.

⁶² See, e.g., *ActiveVideo Networks, Inc. v. Verizon Communications, Inc.*, 694 F.3d 1312, 1327 (Fed. Cir. 2012) ("[T]he expert's testimony on obviousness was essentially a conclusory statement that a person of ordinary skill in the art would have known, based on the 'modular' nature of the claimed components, how to combine any of a number of references to achieve the claimed inventions. This is not sufficient and is fraught with hindsight bias").

inability, of prior art sensors to support both single-ended and differential interfaces simultaneously is the '290 patent itself.⁶³

C. Samsung Offered No Evidence that Roe or Toshiba Would Have Increased the Performance and Versatility of Umeda by Enabling Support for “Well-Known Standards”

Samsung's performance/versatility argument hinged in part on the argument that combining Roe or Toshiba with Umeda would allow Umeda to use additional interface standards. Specifically, Dr. Baker implied that an interface's performance and versatility depended on its ability to support “well-known standards” such as PC Card or IEEE-1394 (Firewire), and suggested that there was a reason to combine Roe or Toshiba with Umeda because that would somehow provide Umeda with additional performance or versatility that Umeda did not already have.⁶⁴ No evidence was presented to support this theory.

First, the disclosure of PC Card, IEEE-1394 and “the like” in Umeda⁶⁵ confirms that Umeda's interface was designed with those standards in mind, and thus already supports them. Samsung offered no evidence at trial to explain how combining Roe or Toshiba with Umeda would provide greater support for PC Card, IEEE-1394, or “the like,” that Umeda does not already account for. In a similar vein, Samsung offered no evidence that the interfaces of Roe or Toshiba were required to comply with the PC Card or IEEE-1394 standards. On this record, Dr. Baker's conclusory opinion that using Roe or Toshiba would enable PC Card or IEEE-1394 support in Umeda was nothing more than the product of unfounded speculation.⁶⁶ If anything, the evidence shows that Roe or Toshiba would not enable further support for PC Card or IEEE-

⁶³ See '290 patent, D.I. 87-2, at, *e.g.*, col. 1, ln. 17 to col. 2, ln. 62; col. 3, ll. 4-18, 20-37.

⁶⁴ See D.I. 320, 2/4/2016 trial transcript at, *e.g.*, 11:20-12:3; 33:3-10; 34:1-17.

⁶⁵ See Ex. 3, Umeda, U.S. Patent No. 6,452,632, at figure 14.

⁶⁶ See, *e.g.*, *Broadcom*, 732 F.3d at 1334 (“Pickering does not address the '150 patent's critical ‘data path,’ i.e., the data recovery function. As the district court found, the record does not support Emulex's contention that Pickering implicitly requires a data path. Pickering's device is designed to match transition points, or cross-over points, on a waveform. At the cross-over points there is no data to recover, so Pickering cannot inherently require recovering data”).

1394 that Umeda does not already envision. Again, as Dr. Baker testified, PC Card operates as either a single-ended interface or a differential interface.⁶⁷ Assuming Umeda complies with the single-ended PC Card standard, meaning it uses only a single-ended interface, no benefit would be gained from using Roe or Toshiba because the standard would not be using the differential portion of the interface in Roe or Toshiba. And assuming Umeda complies with the differential PC Card standard, meaning it uses only a differential interface, no benefit would be gained from using Roe or Toshiba because the standard would not be using the single-ended portion of the interface in Roe or Toshiba. The same holds true assuming that Umeda complies with the differential IEEE-1394 standard.⁶⁸

Second, Samsung offered no evidence that Umeda—or any other prior art reference—found it desirable to use both a single-ended interface (such as single-ended PC Card) and a differential interface (such as IEEE-1394 or differential PC Card) simultaneously. To the contrary, the record evidence shows only that either IEEE-1394 or PC Card could have been used alone, but not in conjunction with each other.⁶⁹ Thus, Samsung’s “well-known standards” argument failed.⁷⁰

In a similar case, *InTouch Technologies v. VGo Communications*, the Federal Circuit found the defendant had failed to meet its burden of proving obviousness by clear and

⁶⁷ See D.I. 320, 2/4/2016 p.m. trial transcript at 11:14-15.

⁶⁸ See *id.* at 11:16-19.

⁶⁹ See Ex. 3, Umeda, U.S. Patent No. 6,452,632, at fig. 14 (proposing that PC Card, IEEE-1394, or “the like” be used in the disjunctive, rather than the conjunctive).

⁷⁰ Dr. Baker suggested in passing that Roe or Toshiba could have improved flexibility by virtue of the fact that they performed both single-ended and differential transmission. See D.I. 320, 2/4/2016 p.m. trial transcript at 34:3-7. Dr. Baker did not explain how or why this would have improved flexibility, either generally or in the system of Umeda. Even assuming Roe or Toshiba would have improved the flexibility of Umeda’s interface, that still leaves unaddressed the required reason or motivation to create a CMOS image sensor interface capable of choosing between “selectable” single-ended and differential outputs, as recited in claim 10 of the ’290 patent. See ’290 patent, D.I. 87-2, at, *e.g.*, col. 6, ll. 1-3. Samsung offered no evidence at trial to show that a person of ordinary skill in the art would have implemented the circuitry of Roe or Toshiba in Umeda to use selectable single-ended and differential outputs, as opposed to, for example, preconfigured or permanently fixed single-ended and differential outputs.

convincing evidence at trial, warranting JMOL of validity, where the record reflected a nearly identical degree of evidentiary shortcomings.⁷¹ The court noted that the testimony of the sole invalidity expert was “plagued with numerous problems,” including the failure to articulate a sufficiently supported reason to combine the prior art references, impermissible hindsight, and mere conclusory statements that one of ordinary skill in the art “could” have combined those references.⁷² The testimony of Dr. Baker, the lone invalidity expert on the ’290 patent, was plagued with these same problems, and, as such JMOL of validity of the ’290 patent should be granted.

D. Samsung’s Generalized “Reasons” of Size, Cost, Performance, and Versatility Would Not Have Motivated One of Ordinary Skill in the Art to Make the Asserted Combinations

Even assuming *arguendo* that reducing the size and cost of interfaces while improving their performance and versatility was known to be desirable in the prior art, those generalized needs did not rise to the level of a reason to combine features or elements from particular prior-art references. As the Federal Circuit recognized in *Innogenetics v. Abbott Labs*, knowledge of a problem and motivation to solve it “are entirely different from motivation to combine particular references to reach the particular claimed [invention].”⁷³ In another instructive precedent dealing with the same issue, *ActiveVideo Networks v. Verizon*, an invalidity expert offered the following trial testimony that almost mirrored the testimony offered by Samsung’s Dr. Baker here:⁷⁴

The motivation to combine [the asserted references] would be because you wanted to build something better. You wanted a system that was more efficient, cheaper, or you wanted a system that had more features, makes it more attractive to your customers,

⁷¹ *InTouch*, 751 F.3d at 1346-53.

⁷² *See id.* at 1348-49, 1351-52.

⁷³ *Innogenetics*, 512 F.3d at 1373; *see also, e.g., In re Armodafinil Patent Litigation Inc.*, 939 F.Supp.2d 456, 500 (D. Del. 2013) (“[F]or a patent challenger to establish obviousness, it is insufficient to allege a general motivation to discover an undefined solution that could take many possible forms”) (citing *Innogenetics*, 512 F.3d at 1373-74).

⁷⁴ *ActiveVideo Networks*, 694 F.3d at 1328.

because by combining these two things you could do something new that hadn't been able to do before.

Relying principally on *KSR* and *Innogenetics*, the Federal Circuit rejected this expert testimony in *ActiveVideo* as insufficiently probative of a reason to combine, deeming it “generic and bear[ing] no relation to any specific combination of prior art elements.”⁷⁵ The court also found that it “fail[ed] to explain why a person of ordinary skill in the art would have combined elements from specific references *in the way the claimed invention does*.”⁷⁶ From this, the court held the record insufficient to support the jury’s finding of obviousness and affirmed JMOL for the plaintiff on validity.⁷⁷ Dr. Baker’s testimony here, like that offered in *ActiveVideo*, *supra*, was generic and bore no relation to the specific combinations of Roe or Toshiba and Umeda. At most, Samsung showed there might have been a motivation to reduce the size and cost of interfaces, and to improve their performance and versatility.

To the extent Samsung contends that the needs or problems it identified at trial could nonetheless have served as legitimate reasons to combine, this argument also fails. In *KSR*, the Supreme Court noted that “[u]nder the correct analysis, any need or problem known in the field of endeavor at the time of invention and addressed by the patent can provide a reason for combining the elements in the manner claimed.”⁷⁸ Further, “the prior art need not address the exact problem that the patentee sought to resolve.”⁷⁹ These statements, however, did not alter the obviousness analysis or test: The party adducing these needs or problems as reasons to combine must still explain, with evidence, how they would be addressed by combining the references at issue.⁸⁰ That was not done here. As explained above, Samsung offered no evidence

⁷⁵ *Id.* (citing *KSR*, 550 U.S. at 418, and *Innogenetics*, 512 F.3d at 1373).

⁷⁶ *Id.* (emphasis original).

⁷⁷ *See id.*

⁷⁸ *KSR*, 550 U.S. at 420.

⁷⁹ *Tyco Healthcare Group LP v. Ethicon Endo-Surgery, Inc.*, 774 F.3d 968, 977 (Fed. Cir. 2014) (citing *KSR*, 550 U.S. at 420-21).

⁸⁰ *See, e.g., Commonwealth Scientific and Indus. Research Organisation v. Buffalo Technology (USA), Inc.*, 542 F.3d 1363, 1374-75, 1375-76 (Fed. Cir. 2008).

to show that combining Roe or Toshiba with Umeda would reduce the size and cost of Umeda's interface or improve its performance and versatility. Indeed, as further explained, the evidence shows those outcomes would not have been achieved through the combinations at issue.⁸¹

In effect, the "obviousness" argument Samsung presented at trial was that the circuit in Roe or Toshiba *could* have served as the interface for the image sensor in Umeda, because Umeda's stated goals (of reducing the size and cost of the sensor while improving its performance and versatility) *could* have been addressed by combining it with Roe or Toshiba. This was not the correct obviousness analysis. In *In re Etter*, the Federal Court noted that the proper inquiry is not whether prior art references could be combined, but "whether the claimed inventions are rendered obvious by the teachings of the prior art as whole."⁸² Similarly, in *In re Gordon*, the court held, "The mere fact that the prior art *could* be [] modified [does not make] the modification obvious unless the prior art suggested the desirability of the modification."⁸³ And in this case, the mere fact that the circuit in Roe or Toshiba could have been combined with the image sensor in Umeda did not make that combination reasoned or the '290 patent obvious.⁸⁴

⁸¹ To the extent Samsung contends "common sense" and "ordinary creativity," *KSR*, 550 U.S. at 420, 421, would have led to the asserted combinations, the argument likewise fails. On this point, Umeda states, "If, for example, an appropriate interface is not used, a large number of pins are required to result in an increase in the chip area of the sensor or the size of the package. An increase in cost cannot therefore be avoided." Umeda, U.S. Patent No. 6,452,632 at 1:64-67. Based on this, common sense would dictate moving to a cheaper, more compact single-ended interface (if starting with a single-ended interface) or a cheaper, more compact differential interface (if starting with a differential interface). Common sense would not dictate moving from a purely single-ended or purely differential interface—which, again, is all Umeda discloses—to a larger, more complicated (and presumably more costly) interface like those in Roe or Toshiba. The complexity of the underlying technology also weighed against using common sense here. See *Kinetic Concepts*, 688 F.3d at 1369 ("[T]he technology at issue here is not the type of technology where common sense would provide the motivation to combine these references").

⁸² *In re Etter*, 756 F.2d 852, 859 (Fed. Cir. 1985); see also *In re Keller*, 642 F.2d 413, 425 (Fed. Cir. 1981) ("The test for obviousness is not whether the features of a secondary reference may be bodily incorporated into the structure of the primary reference").

⁸³ *In re Gordon*, 733 F.2d 900, 902 (Fed. Cir. 1984) (fact that prior art apparatus could be turned upside down did not make that modification obvious unless "a fair reading of the prior art references as a whole" suggested the desirability of turning the apparatus upside down).

⁸⁴ See, e.g., *Advanced Technology Incubator, Inc. v. Sharp Corp.*, 2009 WL 4723734, at *4-5 (E.D. Tex. Sep. 8, 2009) (Bryant, J.) (that various prior art references could be combined did not render claimed invention obvious where "no evidence in the record support[s] the assertion that a person skilled in the art

CONCLUSION

Samsung offered no evidence to support any of its alleged reasons to combine Roe or Toshiba with Umeda in order to reach the particular combination of elements claimed in claim 10 of the '290 Patent. Thus, there was no legally sufficient basis for a jury to conclude that a person of ordinary skill in the art had a reason to combine those references, as the law of obviousness requires. Accordingly, Imperium respectfully requests that the Court grant its renewed motion for judgment on the law and find claim 10 not invalid.

would find these combinations obvious”); *see also, e.g., Smartflash v. Apple, Inc.*, 2015 WL 660293, at *6-7 (E.D. Tex. Feb. 13, 2015) (Mitchell, J.) (rejecting defendants’ argument that feature of one prior art reference could be substituted for similar feature in another prior art reference and would thus be obvious to combine; “the cited evidence fails to clearly explain why a [person having ordinary skill in the art] would be motivated to combine the references”); *Novamedix Distribution Ltd. v. Dickinson*, 175 F.Supp.2d 8, 12 (D.D.C. 2001) (“The argument is that the only elements of the ’101 patent not expressly claimed in an earlier Novamedix patent, U.S. Patent No. Re. 32,939, are the functional parameters, i.e., the holding periods. The argument is rejected, because the ’939 patent does not teach or disclose an automatic means for controlling the holding period. Thus, while the apparatus disclosed by the ’939 patent could be combined with an automatic means for controlling the holding period, the combinability is no more obvious than with the Dreiser reference”).

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CERTIFICATE OF SERVICE

I hereby certify that on September 21, 2016, I electronically filed the foregoing with the Clerk of Court for the United States District Court for the Eastern District of Texas, Sherman Division, via the CM/ECF system, which will send a notice of filing to all counsel of record who have consented to service by electronic means.

By: /s/ R. William Sigler
R. William Sigler